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Follow the Leader": Leadership and Incentives to Use Enterprise 2.0 Applications

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Research-in-Progress

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Abstract

E2.0 facilitates the efficient collaboration of employers and workers across departmental boundaries. The exponential growth of nascent enterprise-level social network platforms implies important impacts on employees' daily working styles and the implementation decisions made regarding these platforms represent the significant digital innovation. Despite this importance, limited effort has been devoted to understanding whether company senior managers' leadership influences employees' commitment to E2.0-driven change. Using a novel proprietary dataset from a leading E2.0 platform, we investigate the impact of change leadership perceived by employees on the implementation of E2.0. The sample includes information on 575 paid customers (i.e. firms) with 65,407 individual users and 2,286 previous customers with 99,807 individual users from 2011-2016. Our research will provide key insights for several groups of stakeholders, including platform developers, company senior managers, and workers. The expected contribution and practical implications are discussed.

Keywords: Change leadership, Enterprise 2.0, Data analysis.

Introduction

The propensity of many Web 2.0 applications (e.g., Facebook, LinkedIn, and Twitter) today relies entirely on free consumer usage. Similarly, in the organizational context, the successful implementation of Enterprise 2.0, the use of emergent Web 2.0 applications within companies, is highly determined by employee usage. Popular E2.0 examples include Yammer, integrated into Office 365, and Alibaba's

DingTalk. Other leading Enterprise-level 2.0 startups include Mingdao, Socialcast, Chatter, and HipChat. E2.0 has become recognized as a burgeoning business market, growing at a compound annual growth rate (CAGR) of 31 percent over the period 2012-2016 (Research and Markets, 2013). Anecdotal evidence suggests that E2.0 platforms are rapidly becoming adopted by leading companies, but that many E2.0 platforms face difficult challenges in survival, owing to a low free-to-paid conversion rate (Mangiuc, 2011). Companies may not upgrade their free account after the trial period if only a few employees carry out daily business activities through the focal E2.0 platform. Even for the biggest Enterprise 2.0 platform, Yammer, the average conversion rate from free trials to paid users is only 15% (Jia et al., 2017). Thus, an increasing number of E2.0 software developers have switched their sales focus from aimlessly gaining free users to placing emphasis on customers that are likely to continue with E2.0 services after the trial period.

Efforts have been made to understand more about the technology and to identify factors affecting the adoption decisions of E2.0. Various empirical studies based on explanatory models in the IS literature have been conducted to examine the initial and continuance adoption behavior toward E2.0. For example, Lin et al. (2010) develop a value-based adoption model (VAM) and show perceived benefits and perceived costs can significantly influence the value perceived by mangers by adopting E2.0, although respondents were 80 part-time MBA students rather than real E2.0 users (i.e., companies). Wang et al. (2014) apply the UTAUT to propose a research model that incorporates context-specific variables as enhancing constructs to predict individuals' adoption intention toward Enterprise 2.0 applications. A professional E2.0 platform, Clearvale was used as their research context and employees of seven companies that use the platform's trial version were invited to participate in a paper-based questionnaire. Their research findings suggest that some general IS adoption factors are still significant in the E2.0 initial adoption context including perceived usefulness and perceived ease to use. Jia et al.'s (2017) research integrates the IS continuance model (Bhattacherjee 2001) and the Technology-Organization-Environment (TOE) framework (Tornatzky et al. 1990). They incorporate four constructs into the IS continuance model: firm size, firm scope, subjective norms and competitive pressure from the perspective of organizational and environmental context based on the TOE framework and verify the model. These explanatory models significantly help E2.0 application developers to effectively understand and identify important factors underlying behaviors and the causal relationships among them.

In this paper, we examine the causal relationship between change leadership and employee commitment to use E2.0 applications for their daily business activities in the setting of Mingdao, a leading E2.0 application platform in China. Change leadership refers to company leaders' tendency toward implementing a particular change at hand and encouraging employees' adoption toward the specific change (Herold et al., 2008; Higgs et al., 2000; Orridge, 2013). Unlike prior studies focusing upon developing explanatory models based on individuals' perceptions (e.g. perceived usefulness), we try to develop a model to investigate if company leaders' E2.0 usage level affect employees' tendency toward adopting E2.0 through a top-down process that describes how change leadership factors influence employees' willingness to actively use E2.0 in their daily business activities. For this purpose, we had access to the firm's accumulated archival data. Through several years of development, this company has become recognized as the most influential E2.0 platform in China (CSCE, 2016; IDC, 2015). At the end of December 2016, more than 2,283 firms had registered and used its E2.0 applications, and 575 firms had continued to renew their accounts after the trial period ended. The information available from the E2.0 platform included all user personal registration information (e.g. their company positions), and account activity information (e.g. the number of posts that each account submits per day).

Literature review

Our study makes several contributions. First, this paper contributes broadly to the literature related to the economic and social implications of E2.0. Enterprise social network platforms broadly refer to the use of in-house intranet software and third-party Enterprise 2.0 applications built on cloud computing Web 2.0 infrastructure to improve communication and collaboration between employees (Boulos et al. 2006; Miles, 2009), knowledge management (Paroutis and Saleh 2009; Zhao and Chen 2013), adoption processes (Bruno et al 2008; Louw and Mtsweni 2013), and emergency response capabilities (McAfee 2006, 2009). In addition, individual-level Web 2.0 applications, such as Facebook, Twitter and Google+

can also help an organization to stay close to their customers and conduct research to improve business processes and operations. During the last decade, research scholars have extensively studied the phenomenon of E2.0 from different perspectives, including E2.0 infrastructure to improve communication and collaboration between employees, knowledge management, adoption processes, emergency response capabilities, the implementation strategy, and the challenges and change factors of E2.0 implementation. For example, Lin et al. (2010) propose that perceived benefits and perceived costs can significantly influence the value perceived by managers of adopting E2.0. Wang et al.'s (2014) research findings suggest that some general information systems (IS) adoption factors are still significant in the E2.0 initial adoption context including perceived usefulness and perceived ease of use. Jia et al. (2017) find that subjective norms and competitive pressure, significantly influence enterprises' intentions to renew their E2.0 service in addition to technology perceptions. All these studies, however, focused mainly on the influence of users' perceptions and developed explanatory models: it is therefore not appropriate for investigating the internal relationship between firms and individual characteristics and the focal firm's E2.0 continuance usage behavior. Therefore, it is important for us to develop a predictive model based on accumulated platform operation data (e.g. the number of daily new posts within a firm) and account registration information (e.g., the number of employees) so that E2.0 providers can optimize their sales resources and identify potential customers with a high possibility of long-term use.

Second, we attempt to address the gap in our understanding of the impact of leadership in digital innovation and implementation. Extant literature has suggested that leadership and employee change to commitment has a significant impact on the implementation of organizational changes (Gao-Urhahn, Biemann, & Jaros, 2016; Shin, Taylor, & Seo, 2012). However, past work has largely relied on field experiment or self-based report to examine the influence of leadership on employee change. While these methods may perform well in identifying the causal impact of leadership on innovation outcomes, they are generally expensive, time incontrollable, and tedious to implement. The implementation of Mingdao E2.0 in different companies over various time periods creates a natural experiment design that allows the examination of leadership on digital innovation; the successful continuance usage of Mingdao largely relies on employees' commitment to change toward adopting the new social software platform within companies, or between companies and their partners or customers. The natural experimental approach used in this study will examine the influence of leadership on innovation across a large number of companies. Not only is this less tedious to execute, but it also provides the opportunity to investigate the effect of change leadership across multiple companies and industries, allowing for broader study implications.

Predictive model

Compared with the explanatory models in the IS literature, such as, the technology acceptance model (Davis, 1989), and UTAUT model (Venkatesh,2013), focusing upon identifying perception-based factors and describing the cause-effect relationships among the factors to explain past behavior, predictive modeling aims to uses statistics to predict outcomes. Because our dependent variable (a likelihood of conversion) is binary, we develop a standard logit regression model. The standard logit approach models the probability that a firm will continue to renewing their E2.0 services after the trial period:

$$\log \frac{\Pr(\text{renew})}{1-\Pr(\text{renew})} = \alpha_1 + \beta_1 X' + \beta_2 Z' + \tau \quad (1)$$

where X denotes a row vector of individual level characteristics and Z is a row vector of firm-level variables, the terms $\{\alpha_1, \beta_1, \beta_2\}$ are parameters to be estimated and τ represents the error term. The model is estimated via logistic regression with robust standard errors. A summary of key variables is provided in the data section as below.

Data

The focal firm provided us with information on 575 paid customers (i.e. firms) with 65,407 individual users. Moreover, the data for 2,286 previous customers with 99,807 individual users was provided for the six years from 2011 to 2016. As shown in Table 1, E2.0 enterprise users are based in IT, R&D, retailing, manufacturing, culture and entertainment, business service and other industries. The numbers regarding the shared files, replies and tasks are related to the activities on the platform. The individual-

level characteristic variables include gender, age, company position, and educational background, completeness of information, and account usage patterns over time. E2.0 usage patterns over time were collected to include task information related variables (e.g., the number of replies to a task), thread-related variables (the number of posts within a thread and the number of votes), and sharing activities (e.g., the number of files uploaded or the number of shared pictures). Other variables include whether leaders are active users of Web 2.0 applications, such as LinkedIn, Facebook and Twitter. We built an automatic web crawler to automatically examine an individual's LinkedIn, Facebook and Twitter accounts according to his or her background information (e.g., full name, current employer and contact address, and company website). We observe leaders' activity heterogeneity with respect to the E2.0 usage of managers. For example, we examined the types of E2.0 usage activities of firm's leaders (e.g., the number of leaders' posts) that influence decision making regarding employees' commitment to change their usage habits from traditional communication tools to E2.0 applications.

Industry	Number	Percent
Real estate services	19	0.71%
Public administration, social security and social organization	50	1.88%
Building and construction	76	2.85%
Transportation, storage and postal industry	17	0.64%
Education	66	2.48%
Financial industry	110	4.13%
Residents service, repair and other service industry	78	2.93%
Scientific research and technology service industry	434	16.28%
Wholesale and retail industry	386	14.48%
Water conservancy, environment, public equipment management	10	0.38%
Health and social work	4	0.15%
Culture, sports and entertainment industry	289	10.84%
Information transmission, software and information technology service industry	491	18.42%
Manufacturing industry	300	11.25%
Accommodation and catering services	42	1.58%
Leasing and business service industry	272	10.20%
Total	2666	100%

Table 1. Enterprise User Industries for Mingdao

Descriptive statistics

Initial descriptive statistics on the data provided the results as shown in Table 2. Here, there are two groups of data. The variable Renew =1 refers to enterprises that have continuously adopted E2.0; in obverse, Renew =0 means that enterprises have stopped continuously adopting E2.0. Within the data set, three levels of employees are examined, "High", "Middle" and "Low". We can clearly observe significant differences between the two adoption groups regarding the number of employees, shared documents, total number of posts, tasks, and responses. The averages of these variables for the E2.0 adoption group are nearly all higher than their equivalent for the non-adoption group. Enterprises in the non-adoption group clearly did not adopt E2.0 effectively and actively with notably fewer operations on the platform. This can be shown most obviously via the number of tasks. Therefore, during the

process of adoption, managers and client consultants should pay attention to such variables over time to monitor usage and actively encourage employees to work on the platform to build a critical mass of activity.

	Renew=1		**Renew=0**		**Difference (1-0)**
Variables	N	Mean	N	Mean	Mean
Employee_N	575	107.91	2283	42.12	65.79***
Employee_High	458	7.99	1531	5.07	2.92***
Employee_Mid	573	32.01	2022	14.33	17.69***
Employee_Low	575	69.52	2198	27.01	42.50***
Documents_N	575	2184.06	2283	435.23	1748.83***
Documents_High	458	257.83	1531	64.49	193.33***
Documents_Mid	573	665.65	2022	139.67	525.98***
Documents_Low	575	1314.25	2198	278.54	1035.71***
Actives_N	575	238.85	2283	55.18	183.66***
Actives_High	458	29.35	1531	8.34	21.01***
Actives_Mid	573	79.06	2022	31.01	48.05
Actives_Low	575	136.07	2198	22.98	113.09***
Response_N	575	475.26	2283	32.70	442.55***
Response_High	458	58.25	1531	9.68	48.58***
Response_Mid	573	173.72	2022	13.25	160.47***
Response_Low	575	255.13	2198	15.04	240.08***
Task_N	575	1061.45	2283	1.42	1060.03***
Task_High	458	86.79	1531	0.03	86.76***
Task_Mid	573	318.17	2022	0.58	317.59***
Task_Low	575	674.73	2198	0.91	673.82***
Layoff_N	575	55.97	2283	0.00	55.97
Layoff	575	0.48	2283	0.00	0.48
Avg_Age	575	27.45	2088	27.58	-0.13
* significant at 10% level, ** significant at 5% level, and *** significant at 1% level. A t test is performed the two groups regarding the number of employees, shared documents, total number of posts, tasks, and responses.					

Table 2. A summary of descriptive statistical results

Based on the data for continuous versus non-continuous adoption E2.0 users, the relationships between the above-mentioned variables and the probability of continuous adoption will be estimated by the logit regression model.

Expected contribution

This research will contribute to the emerging stream of E2.0 and leadership in digital innovation literature. In contrast to prior E2.0 adoption studies that have predominantly focused upon developing explanatory models identifying important factors and examining causal relationships among perception-based factors, our contribution is to develop a predictive model to estimate the probability that a firm will pay license fees to continue using an E2.0 service after its account expires, using a unique data set from a leading E2.0 provider. Moreover, the relationship between usage behaviors of individual users and task completion efficiency can also be further estimated based on the variables related to replying

to others, number of thump up for others, number of getting thump up from others, and number tasks that are participated in. We also make a potential methodological contribution to the leadership literature by introducing a natural experiment approach in the E2.0 adoption context to identify the effect of change leadership on digital innovation. Practically, the proposed model can help E2.0 sales managers to allocate preferential resources for proactively maintaining customer relationship management (CRM) with firms that have a higher probability of continuing to use the focal firm's E2.0 applications. Moreover, the analysis pattern for the E2.0 enterprise users can also provide a real-time usage situation of employees for managers, which can guide managers to understand the status quo and attempt to encourage employees to change their behavior more effectively and successfully, for example, by giving them more praise and replies, or delegating more tasks to subordinates to empower them.

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